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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,452

09/28/2006

Kazuo Fujiura

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07/02/2009

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EXAMINER

WIESE, NOAH S

ART UNIT

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,452	Applicant(s) FUJIURA ET AL.	
	Examiner NOAH S. WIESE	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,6 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,6 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Status of Application

1. Acknowledgement is made of remarks filed 05/01/2009. No claims are amended, added, or cancelled with the remarks.
2. The claims 2, 6, and 11 are pending and presented for the examination.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiyama et al (US 6043940) in view of Maciolek et al (Growth of potassium tantalite dielectric crystals...).

Regarding **claim 2**, Kamiyama et al teaches optical lenses with compositions that include KTaO_3 (see Abstract). While Kamiyama parenthetically classifies single crystal KTaO_3 as an orthorhombic material, it would have been obvious to one of ordinary skill in the art that single crystal KTaO_3 is actually cubic in structure. This is shown by the teachings of Maciolek et al, which teaches that single crystals of KTaO_3 grown by the Czochralski technique have a cubic structure at room temperature (see page 96, Introduction and Materials Preparation sections). Kamiyama also uses the Czochralski technique for growing the single crystals (see column 6, lines 7-9). Thus, it is clear that KTaO_3 is actually a cubic material at room temperature, and therefore Kamiyama in fact does teach an optical medium and lens comprising cubic KTaO_3 .

As discussed above, absent any teaching by Kamiyama or evidence presented by applicant, the formula for KTaO_3 taught by Kamiyama is taken to be accurate, with a

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“d” value of 0. Thus, this limitation is also taught by Kamiyama. Therefore, claim 2 is obvious and not patentably distinct over the prior art of record.

Regarding **claim 6**, as discussed above, Kamiyama et al teaches optical lenses with compositions that include KTaO_3 and have a cubic crystal structure. Kamiyama further teaches that the material has an index of refraction of 2.25 see column 5, line 2). While Kamiyama does not specifically teach the transmission through a 10mm thickness, this degree of transmission would necessarily follow from the material's composition and structure. Because, as discussed above, Kamiyama teaches a lens with the same structure and composition as that of instant claims, the lens would necessarily also have the same transmission properties. Further evidence of this is shown by the fact that Kamiyama has the same refractive index property as instant claims, as refractive index is another optical property dependent on composition and structure. For these reasons, claim 6 is obvious and not patentably distinct over the prior art of record.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiyama et al (US 6043940) in view of Maciolek et al (Growth of potassium tantalite dielectric crystals...) and in further view of Fujikawa et al (US 6559084).

Regarding **claim 11**, as discussed above, the compositional and structure limitations of claim 11 are not patentably distinct over the teachings of Kamiyama in view of Maciolek et al. The claim differs from the above-cited prior art because Kamiyama et al does not teach that the optical material can be made into prisms. However, the use of $\alpha\beta\text{O}_3$ -type materials to create prisms was known in the art at the

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time the invention was filed. Therefore, it would have been obvious to create prisms from the materials taught by Kamiyama et al.

Fujikawa et al teaches a ceramic composition wherein the main component is BaTiO_3 , an αBO_3 -type material like those of instant application. The material is made into prisms (see column 11, lines 55-67). This teaching would indicate to one of ordinary skill that these types of materials can be formed into prism shapes. Because the usefulness of prisms is well known in the art, one would be motivated to create prism shapes from the materials taught by Kamiyama et al. As discussed above, the KTaO_3 single crystal material taught Kamiyama has a refractive index of 2.25. The transmission deterioration of the material under a 10-minute irradiation with an irradiation intensity of 2.2 W/cm^2 is not taught by Kamiyama. However, as discussed above, Kamiyama teaches a lens with the same structure and composition as that of instant claims. Therefore, the lens would necessarily also have the same optical properties, including transmission deterioration. Because it would have been obvious to create a prism from the Kamiyama material, and because such a prism would meet all of the limitations of claim 11, the claim is obvious and not patentably distinct over the prior art of record.

Response to Arguments

6. Applicant's arguments filed 05/01/2009 have been fully considered but are not persuasive.

Applicant reiterates the arguments presented in the previous office action that Kamiyama does not teach that the amount of oxygen deficiency (d) is less than 10^{-7} . As evidence of this assertion, applicant presents two papers that purportedly show that the

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oxygen deficiency in the chemical formula KTaO_{3-d} would be at least 10^{-7} . However, neither paper is persuasive at showing that the d value of the Kamiyama formula would be outside of the claimed range.

Imai and Yagi teach a method of introducing protons into a KTN material wherein the amount of protons introduced can be increased by increasing the oxygen vacancies and thus water acceptor density. This is done by generating vacancies in the KTN materials by heat treatment or by deoxidation of growing crystals. While the Imai and Yagi paper does show that the materials studied have oxygen vacancies that can be increased in concentration, it fails to show that the material taught by Kamiyama would have a “ d ” value of greater than 10^{-7} . Imai and Yagi does not specify the oxygen vacancy concentration at all for a KTaO_3 material and so the document cannot show that the defect concentration is higher than the claimed range. While the absorption levels discussed by Imai and Yagi (for instance in Figures 5-10) seem to indicate that these materials have some vacancies, this teaching does not show distinctness of the instant claims because the claims allow for vacancies up to a certain level ($d=10^{-7}$) and Imai and Yagi do not disclose anything to indicate that the concentrations are above this level.

Further, as discussed above, the materials prepared by Imai and Yagi have had their oxygen vacancy concentrations purposefully increased for the purposes of introducing protons. The materials are also not necessarily prepared by an equivalent method to the Kamiyama materials and are in many cases not the same material compositionally (not KTaO_3). Because Imai and Yagi teaches materials having

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purposefully increased oxygen vacancy concentrations that are not prepared by equivalent methods to the Kamiyama materials, and because Imai and Yagi do not even teach the specific "d" value of the resulting materials, the fact that the document shows that the studied KTN materials have *some* oxygen vacancies does not distinguish the instant claims by showing that the Kamiyama material has the *specific* "d" value in question, that is, greater than 10^{-7} . Applicant's arguments with regard to this document are not persuasive.

The Swalin reference is also not persuasive at showing that the Kamiyama material would have a "d" value of greater than 10^{-7} . Swalin is directed to oxygen vacancies in a ZnO material while the portion of Kamiyama under discussion teaches a KTaO_3 perovskite. The Swalin teachings regarding oxygen vacancies cannot be used to show that the Kamiyama material, being structurally and compositionally different than ZnO, has a certain concentration of oxygen vacancies. The teachings of Swalin are not commensurate in scope with the instant claims and this line of argument is therefore not persuasive.

As previously discussed, Kamiyama teaches that the material used for the lenses is KTaO_3 . This is equivalent to a "d" value of 0. The evidence presented by applicant is not persuasive, so this teaching is presumed to show that the Kamiyama material has a d value of 0, and thus meets the limitations of instant claims.

For the above reasons, the grounds of rejection previously issued are maintained.

Conclusion

7. All the pending claims are rejected.
8. Applicant's arguments are not persuasive, and the grounds of rejection presented in the previous office action are maintained for the un-amended claims. This is a continuation of prosecution for applicant's Application No. 10/599452. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
9. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NOAH S. WIESE whose telephone number is (571)270-3596. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Noah Wiese
01 July, 2009
AU 1793

/Karl E Group/
Primary Examiner, Art Unit 1793